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ABSTRACT

Multi-variate techniques for attribute data and the backward elimination procedure developed in regression analysis were utilized in an analysis of the occupational aspirations of deep-South adolescents. Data were obtained from interviews with 6,500 10th-grade students in South Carolina, Georgia, Alabama, and Mississippi. The 4 independent variables were father's education, father's occupation, residence, and race. An examination of the models constructed revealed that (1) social class indicators accounted for the largest effect estimates, (2) residence was asscciated with a smaller portion of the variation, and (3) the effect of race was negligible when controls were applied. Application of the most efficient model to black and white subsamples revealed race variations in both composite effect estimates and the rank order of effect estimates. Implications of these findings are discussed in terms of the developmental model of occupational choice, and suggestions for further research are presented. (Author/PS)

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STRUCTURAL MODELS AND OCCUPATIONAL ASPIRATIONS: BLACK-WHITE VARIATIONS AMONG DEEP-SOUTH ADOLESCENTS

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BLACK-WHITE VARIATIONS AMONG DEEP-SOUTH
ADOLESCENTS

Abstract

Multi-variate techniques for attribute data and the backward elimination procedure developed in regression analysis were utilized in an analysis of the occupational aspirations of deep-south adolescents. An examination of the models constructed revealed that: (1) social class indicators accounted for the largest effect estimates; (2) residence was associated with a smaller, yet statistically significant portion of the variation; and (3) the effect of race was negligible when controls were applied. Application of the most efficient model to black and white subsamples revealed race variations in both composite effect estimates and the rank order of effect estimates. Implications of these findings are discussed in terms of the developmental model of occupational choice and suggestions for further research are presented.

STRUCTURAL MODELS AND OCCUPATIONAL ASPIRATIONS:
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ADOLESCENTS

Numerous sociological studies support the proposition that socioeconomic status and residence are positively related to adolescents' occupational orientations (Sewell, Haller and Strauss, 1957; Grigg and Middleton, 1960; Haller and Miller, 1963; Sewell and Orienstein, 1965; [redacted] Harrison, 1969; Cosby and Picou, 1971). Youth from upper socioeconomic status levels and urban areas have consistently been found to have higher status occupational attainment orientations than those of youth from lower class and rural social origins. Barber (1957), Hyman (1966) and others have contended that class variations in socialization practices tend to engender lower achievement goals for lower class youth. As Hyman (1966: 488) has stated:

> ...the lower class individual doesn't want as much success, knows he couldn't get it even if he wanted to, and doesn't want what might help him get success.

Along with socioeconomic status, residence is considered to provide the setting in which youth become familiarized with various occupational alternatives. The limited occupational alternatives available in rural areas tends to restrict the occupational awareness of rural youth, resulting in lower job aspirations, which limits vertical occupational mobility (Lipset, 1955).

Contradictory findings characterize the research literature concerning the relationship between race and occupational aspirations. Various studies have reported that: (1) black youth have higher status occupational orientations than whites (Antonovosky and Lerner, 1959 and Curry and Picou, 1971); (2) black and white youth have similar

occupational orientations (Cosby and Picou, 1971); and (3) white youth have higher status occupational orientations than black youth (Middleton and Grigg, 1959 and Sprey, 1962).

There inconsistent findings suggest that the relationship of social origins to occupational aspirations may be complicated by the racial variable. This study attempts to clarify the relationship between the variables discussed above and occupational aspirations by developing and analyzing several multivariate models by specific racial groups.

METHOD

Subjects

The data for this study were obtained from interviews conducted in 1966 with 6500 tenth grade students in the four deep-south states of South Carolina, Georgia, Alabama, and Mississippi. A probability sample, stratified by size and predominant race of school, was utilized in South Carolina. Purposive sampling procedures based on the socioeconomic characteristics of counties were employed in Georgia, Alabama and Mississippi. This design insured representation of schools located in counties with low socioeconomic levels.

Instrument

Occupational aspirations were determined by an opened-ended question which read: "If you were completely free to choose any job, what would you most desire as a lifetime kind of work?" (Kuvlesky and Bealer, 1966). Responses were initially coded according to a modified version of the Census Occupational Classification. The four independent

variables considered included two indicators of socioeconomic status (father's education and father's occupation), residence, and race.

Statistical Analysis

The researchers utilized a series of multi-variate procedures designed specifically for attribute data. These procedures allowed the ranking of effects of particular independent variables on a dependent variable and additionally allowed for a comparison of the effects of different combinations of the various independent variables. Computation of effects were derived from formulas provided by Coleman (1964: 189-240). These computational procedures for effect estimates were employed in conjunction with an adaptation of the backward elimination procedure utilized in regression analysis, which allows for a systematic deletion of variables found to contribute very little to the estimate of the dependent variable (Draper and Smith, 1966: 167-169).

RESULTS

Bivariate Relationships

In order to determine the comparability of these data with previous studies, bivariate contingency tables were constructed to examine the relationship between aspirations and each of the independent variables. Tests of statistical significance were computed for illustrative purposes. Statistically significant associations were found in each of the four tests as determined by chi-squares (See Table 1). It should be pointed out that as a result of the large sample, the chi-square analysis yielded statistical significance when

there were relatively small differences in observed and expected frequences.

(Table 1 About Here)

High level occupational aspirations were found to be associated with high level fathers' occupation and education, urban residence and white race. Although all the associations were found to be statistically significant, it should be noted that the strength of the association in the various tests ranged from moderate to very weak (e.g., from V = .20 for father's education to V = .07 for race). Although the degree of association was somewhat less than expected in the various tests, the results generally agreed with the theoretical notions and previous empirical research on aspirations.

Selected Multi-Variate Cases

Each of the independent variables were redefined in terms of "high" and "low" states. The "high" state referred to that state of the variable which was linked with high aspirations, and, conversely, the low state referred to that state which was associated with low aspirations. Aspiration observations were taken in the form of the proportion of a given sub-class which aspired to professional, technical, managerial, or glamour-type occupations. For each structural variable the following "high"and "low" states were specified:

X(1): High State = Fathers who had 12 years or more of formal education
Low State = Fathers who had less than 12 years of formal education
X(2): High State = Fathers who had professional, technical, managerial, or glamour occupations.
Low State = Fathers with other type occupations
X(3): High State = Residence in a place of 2500 or more.
Low State = Residence in a place of less than 2500.
X(4): High State = Whites
Low State = Blacks

A frequency distribution was carried out controlling on each independent variable, resulting in a factorial arrangement with sixteen sub-class observations. An examination of Table 2 reveals that most of the students manifested high status aspiration levels, including those youth who could be considered the most "disadvantaged," i.e., the sub-class composed of students whose fathers had low-level occupational and educational backgrounds, who were rural residents, and who were black.

(Table 2 About Here)

Effect Estimates

The next phase of the analysis was to partition the variation in aspiration levels. Utilizing procedures outlined by Coleman (1964: 199-201), effect estimates were computed for each independent variable, as well as for random shock (unexplained variation). Intuitively, this approach to estimating variable effects is based on the averages of differences in proportions between sub-classes in which the independent variables were in a high state, and the sub-classes in which independent variables were in a low state. A composite effect estimate equaling the sum of the individual effect estimates was also calculated. The random shock estimate was used as an estimate of unexplained variation.

The effect estimates for each of the variables, as well as the corresponding tests of significance are reported in Table 3. These estimates indicated that the major portion of the variation in aspirations was explained by father's occupation, father's education, and residence. The effect estimates for each of these variables were statistically significant. The composite effect of .289 suggest that

the model accounted for only a moderate amount of the variation in aspiration levels.

(Table 3 About Here)

The effect estimate for race was not statistically significant. In fact, the sign of the estimate was in the direction opposite to that expected. Thus, the original bivariate association between aspiration and race disappeared when controls were applied. The original relationship may be explained in terms of the the disproportionate number of blacks in the lower education, lower occupation and rural groupings.

Backward Elimination

An adaption of the backward elimination procedure (Draper and Smith, 1966) was used in conjunction with the multi-variate techniques developed by Coleman (1964). The backward elimination procedure was originally developed as a multiple-regression technique to aid the researcher in selecting the best regression equation from a set of independent variables. As noted above, this is primarily a procedure which successively deletes those variables from the model which contributes least to the estimate of the dependent variable.

The highest order model, Model I, consisting of variables X(1), X(2), X(3) and X(4) has already been discussed. The racial variable was deleted in the construction of Model II. There was a slight increase in the magitude of the composite effect estimate over the first model. The effect estimates for all three variables (X(1), X(2), and X(3)) in Model II were found to be statistically significant. The two class-associated variables, father's education and occupation,

accounted for the majority of the model's explanatory power. The variable configurations, the effect estimates, the level of statistical significance, and the composite effect estimate for each model derived from the backward elimination is reported in Table 4.

(Table 4 About Here)

The residence variable, which had the smallest effect estimate of the variables in Model II, was deleted in the construction of Model III. The effect estimates for father's education and occupation were found to be statistically significant with a composite effect estimate of .270. Father's occupation was deleted, leaving only father's education in the last model. Again, the effect estimate for father's education was significant.

Model II was judged as the most efficient model of those considered, and was selected for further analysis. This decision was made because Model II manifested the largest composite effect estimate, and also because each of the variables in the model (X(1), X(2), and X(3)) had statistically significant variable effect estimates.

Sub-Models by Race

At this stage in the analysis, the only finding that runs counter to previous research was that race apparently had little direct effect upon aspiration levels. This finding was especially surprising because of the rather sharp disparity in occupational chances which exists between whites and blacks in the deep south. It was decided to further investigate the relationship between aspiration and race by treating both the white and black sub-groups as two distinct populations and applying Model II separately to each population. These models are

reported in Table 5.

(Table 5 About Here)

A composite effect estimate of .384 was obtained when Model II was applied to the white population. All variable effect estimates were found to be statistically significant. The two class-linked variables accounted for the majority of the composite effect estimate. The effect estimate for father's education was .213; for father's occupation .103; and for residence .068.

When Model II was applied to the black population, different results obtained. The composite effect estimate was .258, reflecting a smaller value than observed for either the total, or the white population. The variable effect estimates for father's occupation (.098) and residence (.178) were found to be statistically significant, while the estimate for father's education (.-018) was not significant. Additionally, the rank order of the variable effect estimates for blacks was reversed from the ordering observed previously for both the total and white populations.

Analysis of Residuals

A set of predicted proportions was derived for each model (Coleman, 1964: 195-197). By comparing the predicted proportions P* (i) with the actual P (i), it was possible to determine deviations from the assumptions of the technique. Table 6 reveals the analysis of residuals for Model II when applied to the total, white and black populations.

(Table 6 About Here)

When Model II was applied to the total and white populations, relatively small deviations were observed in all the sub-classes. There was no deviation of .05 or greater. However, large deviations were obtained when Model II was applied to the black population. Five of the eight sub-classes had deviations greater than .05. Thus, it appeared the additive Coleman-type model has considerable utility for explaining aspiration levels for the white population and the total population, but appears to be inadequate for the black population.

Discussion

The analysis can be briefly summarized as follows:

(1) For bivariate relationships, higher level aspirations were found to be associated with higher levels of father occupation and education, urban residence, and white racial status.

(2) Although numerous subclass differences were observed in the multi-variate class, aspiration levels were found to be relatively high in all subgroups (including the most "disadvantaged"). In only one of the sixteen subgroups in Model I (Table 2) was the number of youth aspiring to high level occupations less than a .50 proportion.

(3) Additive models utilizing father's occupation, father's education, residence and race in selected combinations, at best, explained approximately 38 percent of the variation in aspiration levels. The effects of two social class linked variables (father's education and occupation) were found to be stronger than the effects of the other variables.

(4) When controls were applied, the relationship between aspiration levels and race, which had originally been observed in the bivariate

tables, disappeared.

(5) Additive models, utilizing father's occupation, father's education and residence, applied separately to both the white and black samples manifested markedly different results. The models were found to differ in terms of their overall explanatory power, the effect ranking of variables, and the degree of fit of the expected and actual subclass observations.

The first three sets of findings are essentially in agreement with existing research relating the aforementioned structural variables to occupational orientations. A detailed discussion of these results would be largely redundant, serving only to further document already well-established relationships. The rationale for reporting these findings is to demonstrate the similarity between this data set and data sets in previously reported studies, and furthermore, to outline the procedures utilized in arriving at observations four and five. Consequently, the present discussion is centered around the fourth, and in particular, the fifth observation.

Traditional conceptualizations of the influence of structural factors on occupational orientations typically stress differentials in attainment opportunities or chances (sometimes expressed as structural blocks, disparity or impedence) as the theoretical device for explaining depressed orientation levels among "disadvantaged" youth. The general formulation states that there are aspects of being either lower-class, black, or rural (or for that matter any other structural variable with differential opportunity characteristics) that engenders a tendency for lower status occupational orientations. Although the social

class and residence data in this report supports the above formulation, the disappearance of variations, by race, when controlls were applied, indicates that the aspirations of the deep-south black youth included in this study are quite similar to those of their white counterparts.

The problem of reconciling these results with those of past studies, can be approached from two points of view. First, a number of these reports did not utilize social class and residence controls and were perhaps reporting spurious bivariate relationships. Second, some of these studies sampled only a limited segment of the youth population rather than a broad crossection. Bachman (1970) provides a set of data based on a National sample of 10th grade students which tends to support these interpretations.

If the analysis were to end at this point, one might conclude that the structural effect of being black in the deep south has relatively little influence upon occupational aspiration levels. However, when this rather questionable hypothesis is viewed with respect to the differing structural models by race, much different, and perhaps more involved conclusions may be appropriate.

To reiterate, when submodels were analyzed by race, the structural variables in the black submodel explained a smaller amount of variation in aspiration levels than either the general or white models. Of more theoretical interest were the observations that both the rank ordering of effect estimates reversed and that a much poorer "goodness of fit" between estimated and actual subclass propositions occurred for blacks. It may be that the effects of structural variables were operating

in a different manner in the black submodel, and furthermore, that the general structural explanation had much less utility in explaining aspiration levels for black youth.

Several explanations, each admittedly speculative, can be posed as possible formulations which account for these findings. First, the influence of recent civil rights legislation and black power movements may counteract the structural effects of race. That is, the upsurge of feelings of black-pride and growing black consciousness among southern blacks can be expected to influence the development of occupational aspirations - even in the presence of very real disparity in current occupational opportunities. This explanation is based on the "rising aspirations" hypothesis, which holds that recent gains made in the civil rights arena has engendered increased optimism among black Americans concerning occupational attainment (Marden and Meyer, 1968: 304).

When these results are viewed from the more traditional developmental framework of occupational choice (Ginzberg, 1951 and Super, 1953), a typological hypothesis is suggested. The awareness and consequently, the effects of structural disparity in a developmental framework may be stage-linked. More specifically, adolescent stages in the occupational choice process are generally considered to be a period where mediation of occupational desires and opportunities occur (Blau, Gustad, Jessor, Parnes and Wilcook, 1956). Ginzberg (1951) speaks of the proliferation of realistic elements in the occupational choice process during the adolescent years. The differing racial models provide support for the contention that it may prove useful to speak of <u>specific</u> developmental types. Southern black adolescents may begin

to seriously consider "realistic" aspects of attainment at a later period than whites. In Ginzberg's terminology, the "fantasy" and "tentative" stages of choice may be extended. More specific longitudinal data is required before the utility of this explanation can be assessed.

With regard to occupational attainment in the U.S., Duncan (1968: 19) has provided evidence which indicates that black families have "a lesser impact on" their son's occupational opportunities. The findings presented in this study indicate that residence is a more important determinate of black adolescent's occupational aspiration levels than family socioeconomic status. In contrast to the effects observed for socioeconomic status for the white respondents, the effects of this structural variable was significantly smaller for blacks. This finding indicates that as measured in this study, family socioeconomic status has a greater impact on white than black youths' occupational aspiration levels.

Refinements of Model II, which included multiplicative and/or interaction effects, could possibly improve its efficiency for black adolescents. Additionally, considerations of black-white variations in social psychological influences of the occupational choice process may provide research findings which will may further clarify the variations observed in this study.

TABLE 1. BIVARIATE RELATIONSHIPS BETWEEN LEVELS OF OCCUPATIONAL ASPIRATIONS AND FOUR STRUCTURAL VARIABLES[a]

Variable	d.f.	X^2	Cramer's V	Description of the Relationship
X (1) Father's Education	2	290.90	.20	Students whose fathers had at least a high school education had higher aspirations than students whose fathers had less formal education.
X (2) Father's Occupation	4	195.31	.11	Students whose fathers had high level occupations had higher aspirations than students whose fathers had moderate or low level occupations. Very slight differences in aspirations were observed between students with father's who had moderate and low level occupations.
X (3) Residence	6	233.75	.12	Urban students had higher aspirations than small-town, rural non-farm, and farm boys. Only slight differences were observed between small-town, rural non-farm, and farm students.
X (4) Race	2	42.54	.07	White students had slightly higher aspirations than black students.

TABLE 2. PROPORTION OF STUDENTS WITH HIGH OCCUPATIONAL ASPIRATIONS IN THE VARIOUS SUB-CLASSES[a]

X(1) Father's Education	X(2) Father's Occupation	X(3) Residence	X(4) Race	Proportion With High Aspiration
+	+	+	+	.82
+	+	+	-	.78
+	+	-	-	.77
+	+	-	-	.51
+	-	+	+	.67
+	-	+	-	.64
+	-	-	+	.58
+	-	-	-	.58
-	+	+	+	.55
-	+	+	-	.88
-	+	-	+	.48
-	+	-	-	.57
-	-	+	-	.51
-	-	+	-	.60
-	-	-	+	.45
-	-	-	-	.53

[a](+) = High State
(-) = Low State

TABLE 3. COMPARISON OF VARIABLE EFFECT ESTIMATES FOR FOUR VARIABLE MODELS

Variable	Effect Estimate	Z-Score	Statistical Significance[a]
X(1) Father's Education	.099	3.616	Pr [X*(1)$\leq$ 0]$<$.01
X(2) Father's Occupation	.100	3.652	Pr [X*(2)$\leq$ 0]$<$.01
X(3) Residence	.123	4.492	Pr [X*(3)$\leq$ 0]$<$.01
X(4) Race	-.033	1.205	Pr [X*(4)$\leq$ 0] =.11
Composite Effect	.289	-----	----------

[a]The cumulative normal distribution was used to determine the probability that the population effects X*(i) differ from zero. The computation of effect variances was based on a pooling of sub-class proportion variances where each sub-class variance = Pj(1-Pj) /Nj (See Coleman, 1966: 205-210).

TABLE 4. SUMMARY TABLE OF THE ANALYSIS OF THE FOUR MODELS OBTAINED BY BACKWARD ELIMINATION

Model	X(1) Father's Education	X(2) Father's Occupation	X(3) Residence	X(4) Race	Composite Effect Estimate	Estimate of Unexplained Variation
I X(1)+X(2)+X(3)+X(4)	.099*	.100*	.123*	$-.033^{ns}$	.289	.711
II X(1)+X(2)+X(3)	.167*	.097*	.082*	Deleted	.346	.654
III X(1)+X(2)	.180*	.090*	Deleted	Deleted	.270	.730
IV X(1)	.180*	Deleted	Deleted	Deleted	.180	.820

* = $Pr[X^*(i) \leq 0] < .01$ and $^{ns} = Pr[X^*(i) \leq 0] > .05$.

TABLE 5. SUMMARY TABLE OF MODEL II APPLIED TO THE TOTAL, WHITE AND BLACK POPULATIONS[a]

	X(1) Father's Education	X(2) Father's Occupation	X(3) Residence	Composite Effect Estimate	Estimate of Unexplained Variation
Total Population	.167*	.097*	.082*	.346	.654
White Population	.213*	.103*	.068*	.384	.616
Black Population	$-.018^{ns}$	.098*	.178*	.258	.742

[a] $*=Pr[X^*(i) \leq 0] < .01$ and $^{ns}=Pr[X^*(i) \leq 0] > .05$.

TABLE 6. ANALYSIS OF RESIDUALS FOR MODEL II APPLIED TO THE TOTAL, WHITE AND BLACK POPULATIONS[a]

Population		P(123)	P(12)	P(13)	P(1)	P(23)	P(2)	P(3)	P(.)	Departure from the Model[b]
Total	P(i) Actual	.82	.74	.67	.58	.61	.50	.54	.49	Relatively good fit [only small deviations were observed in the various subclasses]
	P*(i) Estimated	.79	.70	.69	.61	.62	.54	.53	.45	
	P(i)-P*(i)	+.03	+.04	-.02	-.03	-.01	-.04	+.01	+.04	
White	P(i) Actual	.82	.77	.67	.58	.55	.48	.51	.45	Relatively good fit [only small deviation was observed in the various subclasses]
	P*(i) Estimated	.79	.73	.69	.62	.58	.51	.48	.41	
	P(i)-P*(i)	+.03	+.04	-.02	-.04	-.03	-.03	+.03	+.04	
Blacks	P(i) Actual	.78	.51	.64	.58	.88	.57	.60	.53	Poor fit [large deviations (D≥.05) were observed in five subclasses: the researchers were unable to determine a systematic pattern in the deviations]
	P*(i) Estimated	.67	.59	.67	.49	.75	.61	.68	.51	
	P(i)-P*(i)	+.11	-.08	-.03	+.09	+.13	-.03	-.08	.02	

[a]The notation used for identifying proportions is such that the numbers in parentheses refer to variables X(1), X(2), and X(3). The variable number appears when that variable is in a high state, e.g., P(23) refers to the proportion of students with high aspirations in the subclass where X(2) and X(3) were in a high state. P (.) refers to the appropriate proportion in the subclass where all variables were in a low state. P*(i) refers to the expected or estimates proportions for the various subclasses.

[b]For reason of convenience, deviations of .05 or greater were considered large (Coleman, 1966: 199).

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